

Introduction to Milwaukee County's *Interactive Mapping Service*

Version 2.0.1

<http://maps.milwaukeecounty.org/>

This document will provide you with the knowledge you need to successfully work with Milwaukee County's *Interactive Mapping Service*, even if you have no prior knowledge of Geographic Information Systems (GIS).

Once you've read through the GIS basics section, you'll start exploring the basics of the *Interactive Mapping Service*. Later, more advanced operations will be covered that will help you find answers to your land information-related questions. At the end, a brief tutorial will take you through some practical uses for many of the *Interactive Mapping Service*'s tools and functions.

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1) GIS Basics

1a. Introduction to GIS

Web-based mapping technologies translate complex GIS technology into a form that can be accessed and used by general users around the world to explore geographic information. Web-based maps have many similarities to traditional paper maps, with some important differences. Instead of just looking at the map, you can explore vast amounts of information for a geographic area far-out or close-up, and learn more about specific features (discreet, mapped objects such as trees, streets, rivers, parks, etc.), and get answers to your questions.

1b. Key GIS Concepts

GIS Concept #1: Features have attributes associated with them

Imagine a tree. How would you keep track of and communicate information about this tree to other people who need to know all about it? You might use a database to keep track of what species it is, how old it is, how tall it is, how healthy it is, and any other attributes (characteristics) that are important.

Records and fields make up a database table. An individual tree (ID=1 in Figure 1b-1) is represented by a single record (or row) in a database. Each category (tree type, age, or height) is called a field.

Figure 1b-1. Sample Record in a Database

ID:	Type:	Age:	Height:
1	Cedar	110	67'

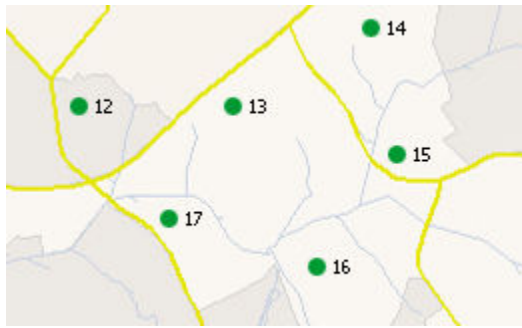
Now imagine a grove of trees for which you need to keep track of attributes. Because we are now dealing with more than one tree, it becomes relevant where each tree is so we know what information relates to which tree.

Figure 1b-2. Database with Multiple Records

ID:	Type:	Age:	Height:
2	Cedar	110	67'
3	Pine	135	80'
4	Spruce	120	72'
5	Cedar	120	70'
6	Spruce	105	65'
7	Pine	115	75'

We map the location of each tree and identify which attributes belong to which tree (Figure 1b-3). This is the foundation of GIS. A GIS tells us where something is and what it is, and can have hundreds of fields (attribute categories such as tree type or tree age) for millions of records (individual trees, in this case).

Figure 1b-3. Mapping Locations



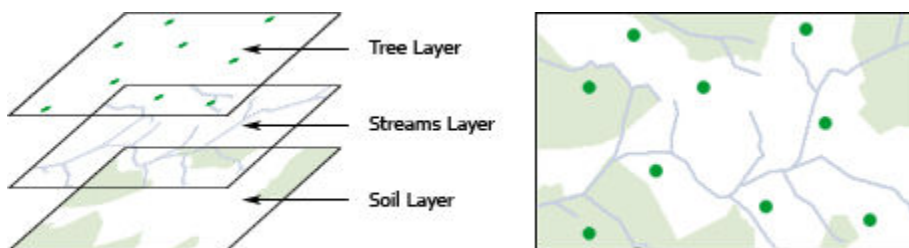
You will be able to examine the attributes of various features as you use the Milwaukee County Interactive Mapping Service.

GIS Concept # 2: Information is separated into layers

A GIS can also include other layers of information (Figure 1b-4). A map might include information about trees as one layer of information, a layer with streams, and another with soil types. Any information with a combination of attributes, location, & shape can be represented as a GIS map layer. GIS users may use the terms coverages, themes, feature classes, or shapefiles interchangeably as synonyms for layers of geographic information found in a map.

GIS layers may be either vector or raster data, characterized by the way mappable information is stored and represented.

Vector Data



Points ■

A point is chosen to represent features (such as trees in a tree layer) that have a definite location but lack width or length, or have a width or length that is not relevant or necessary at a map's viewable scale range.

Lines ↗

A line is used to represent features that have length yet lack width or have a width that is not relevant or necessary at a map's viewable scale range, such as streams in a stream layer.

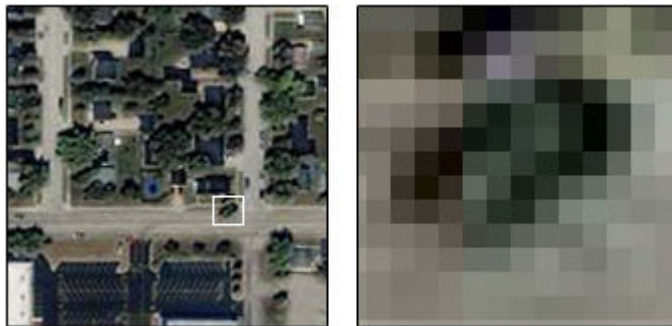
Polygons

A polygon is an area enclosed by any multi-sided shape that can represent features that have width and length, such as soil type regions in a soils layer.

Raster Data

Sometimes a layer of information can be a raster layer (Figure 1b-4), which is a grid that contains information detailing how a cell or pixel should be displayed, and what its location is. Rows and columns of pixels make such a grid; information that constitutes a digital camera image is stored in this manner. The aerial photo layers in the Interactive Mapping Service are rasters. Raster layers don't have attributes associated with them like vector layers, though they all contain pixel values. That single pixel value might be the color of a building's roof in an aerial photo, or it might be a measure of hurricane force for a location. As with a raster that provides information on hurricane intensity, not all rasters are digital photographs, but all digital photographs are rasters.

Figure 1b-4. A Raster Layer (left) contains pixel values (right)



Individual layers may be viewed alone, or can be combined for analysis or other purposes. As you work with the Interactive Mapping Service maps, you will be able to turn different layers on and off to create an almost infinite combination of features for a completely unique map tailored to your specific purposes.

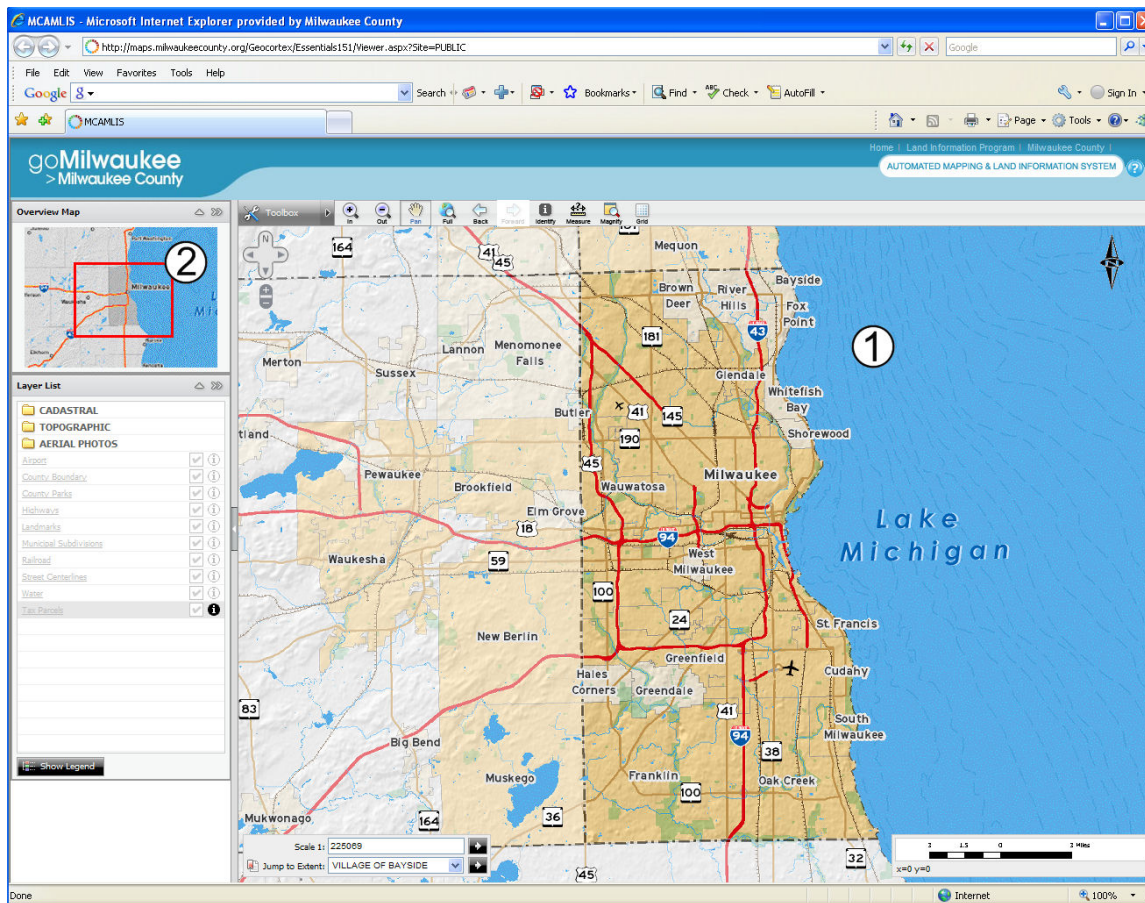
2) Basic Map Navigation

2a. Getting Started

Figure 2a-1 shows what you will see when you open the Interactive Mapping Service in your Internet browser (Internet Explorer, Firefox, etc.). The map information is displayed in the Map Window (1). Beside it is the Information Panel (2), which displays information about the map and lets you do interesting things with the map. Specifically, the Information Panel displays the Overview Map and Layer List, as well as Selection Results and interfaces for various tools and processes.

At the top of the viewer you can see the Toolbar, where you'll find tools that will help you use your map. These tools will allow you to navigate around the map, query features (ask questions about the objects visible in the map), measure distance and areas, and otherwise interact with the information. Scale Information and map coordinates are found at the bottom of the Map Window.

Figure 2a-1: The Milwaukee County Interactive Mapping Service



2b. Navigating Around the Map: The Navigation Toolbar



The Navigation Toolbar allows you to move around the map, zoom in and out, measure and magnify features on a map. The Navigation Toolbar is where you'll find the following resources to help you find your way around the map and perform other tasks:

Zooming and Scale



The Zoom tools work in a way that is similar to using an actual magnifying glass on a paper map, as the icons imply. Unlike a paper map, however, features in a digital map (such as the Interactive Mapping Service) are dynamic. In other words, text or features may automatically appear, disappear, change in size, color, line weight, or line style, etc. based on the viewing scale of the map. The magnifying glass button with the plus sign lets you 'zoom in' (change to a larger scale), while the one with the minus sign lets you 'zoom out' (change to a smaller scale). There are a couple of ways to use these tools.

First, click on one of the zoom tools to activate it, then select a location on the map and press the left mouse button. With the Zoom In tool, the map zooms in. The center of the new map

becomes the location you selected in the previous map extent when you clicked the mouse button. The Zoom Out tool zooms out the same way.

Second, you can use the Zoom tools more precisely by pressing the mouse button somewhere on the map, holding it down, and dragging a box to define the extent you wish to see at a larger or smaller scale. When you let go of the mouse button, the new map extent will be the area defined by the box. Whether you are zooming in or out, the area defined by the box will become the new map extent. When you zoom in, the scale of the map increases (i.e. it gets larger); conversely, zooming out results in a smaller scale.

Scale is a ratio. In other words, 1:10 means that one unit on the map represents ten units in the real world. A 1:10 map would be one-tenth the size of the portion of the real world that the map represents. Because it is a ratio, scale is unit-less, unless otherwise indicated: it doesn't matter if the units are meters, miles, feet, etc. On a 1:100,000 map, a unit on the map represents 100,000 units in real space. Since 1/100,000 is a smaller fraction (or ratio) than 1/10, it is a smaller scale. A large-scale map covers a smaller land area (or "extent") than a small-scale map. For instance, a map of Hales Corners is at a larger scale than a map of Milwaukee County. Typically, a larger scale will provide greater detail over a smaller area, while a smaller scale map will offer less detail over a larger area.

The Navigation Control



To change the map's scale (zoom in or zoom out) without using the Zoom tools, or when a toolbar other than the Navigation Toolbar is active, click on the plus or minus signs of the navigation control located in the upper left corner of your Map Window.

Pan



The Pan tool lets you move around to different parts of the map. With the pan tool, whatever part of the map you "grab" when you click your mouse button will be where you end up when you let go of the mouse button. The extent of the map will change, but not the scale.

Alternatively, you can click on the Navigation Control (located at the top-left edge of the map window) to pan without switching to the Pan tool. Single-click on a directional arrow to incrementally shift the map in that direction. You can also press and hold the mouse button on the navigation control and move the mouse over different directional arrows to navigate around the map. To stop scrolling, just release the mouse button. The Pan tool lets you navigate around the map. Use the Pan tool by clicking and dragging the mouse on the map to reveal different areas. The area of the map that you grab will end up wherever you release the mouse button. For example, if you want to move North (up the map), click and hold near the top and drag the map down. Alternatively, you can use the Navigation Control (Figure 2b-1) located in the upper corner of the Map Window to pan without switching to the Pan tool. Single-click on a directional arrow to have the map shift incrementally in that direction. You can also press and hold the

mouse button on the Navigation Control and move the mouse over different directional arrows to navigate around the map. To stop scrolling, just release the mouse button.

Zoom to Full Extent



The Zoom to Full Extent tool is a quick and easy way to zoom out to the map's maximum display extent. This is especially useful when you want to start fresh without losing the changes you made to the map.

Map Back



Clicking on the Map Back tool will return your map to the previously defined visible extent. For example, a user who is currently viewing the map extent at a scale of 1:250000 zooms into 1:100000, clicking the Map Back button will return the user to their previous scale (1:250000).

Map Forward



If you have used the Map Back button, clicking on the Map Forward tool will return the map to the next defined visible extent.

Identify



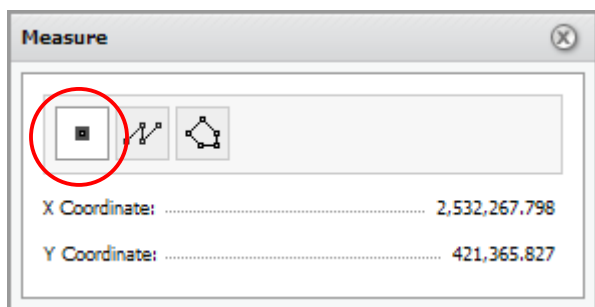
Choose the Identify tool to query a feature you see on the map and display a summary of its attributes. Be sure that the layer of interest is active (Section 2c). The Summary Report (Figure 3g-2, Section 3g) with additional options will appear. Also, when using the Pictometry Oblique Image Navigator (Section 3h), use this tool to select a location to display in the oblique image view.

Measure



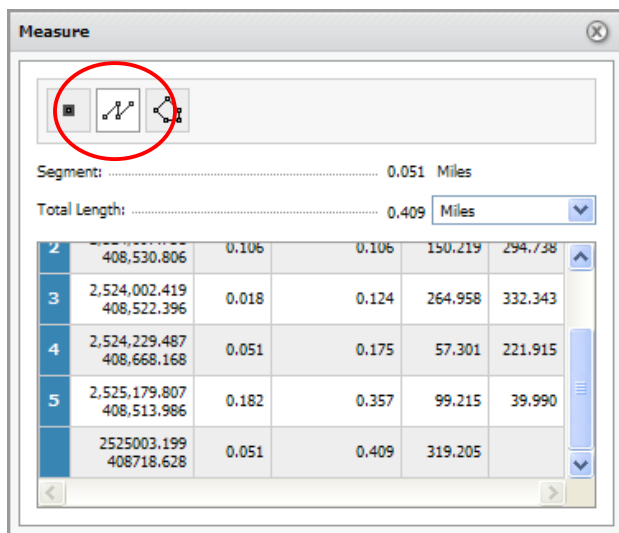
The Measure tool provides three types of measurement: 1) points (coordinates), 2) lines (distances), and 3) polygons (areas) on your map.

Measurement 1: Return a Location's Coordinates



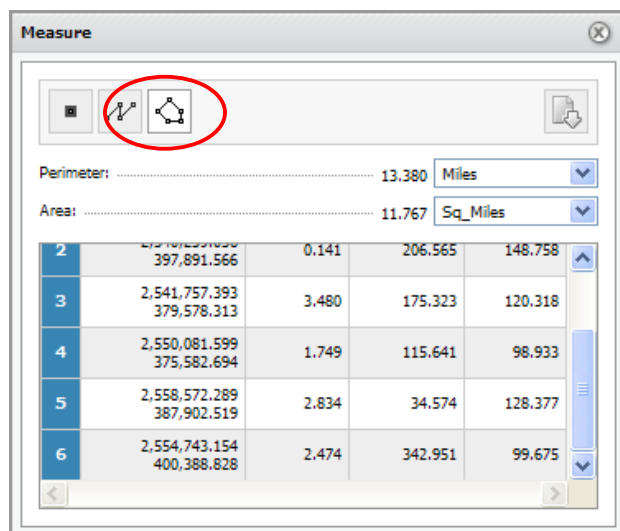
The Measure Coordinates map function allows you to click on the map to return the coordinate location of a particular point. The State Plane coordinates (Wisconsin South Zone 4803) of the selected point will be displayed in the Measure Window.

Measurement 2: Distance



The Measure Distance map function enables you to measure distances on the map. You can measure the distance between two locations, or you can measure the total distance of a route with multiple stops. Click on the desired starting point and add another node by clicking on a different location to complete one line segment. Double-click to end the line. The distance between the two nodes will be shown in the Measure Window, along with the total length of the line. If you are interested in the length of a line with multiple stops (more nodes), simply keep adding nodes. The segment length shown will always refer to the most recent segment. To change the unit of measurement, use the drop-down menu in the Measure Window.

Measurement 3: Area



The Measure Area tool lets you calculate the area inside of a polygon. Use the Measure Area tool to define the vertices (corners) of a polygon by clicking on the map. The tool requires that you specify a minimum of three vertices before an area can be calculated. Add as many vertices as you need to accurately represent the area you want to measure. The calculated area is returned in the Measure Window along with the perimeter of the polygon. If necessary, change the unit of measurement with the drop-down menus provided.

Identify Visible Features



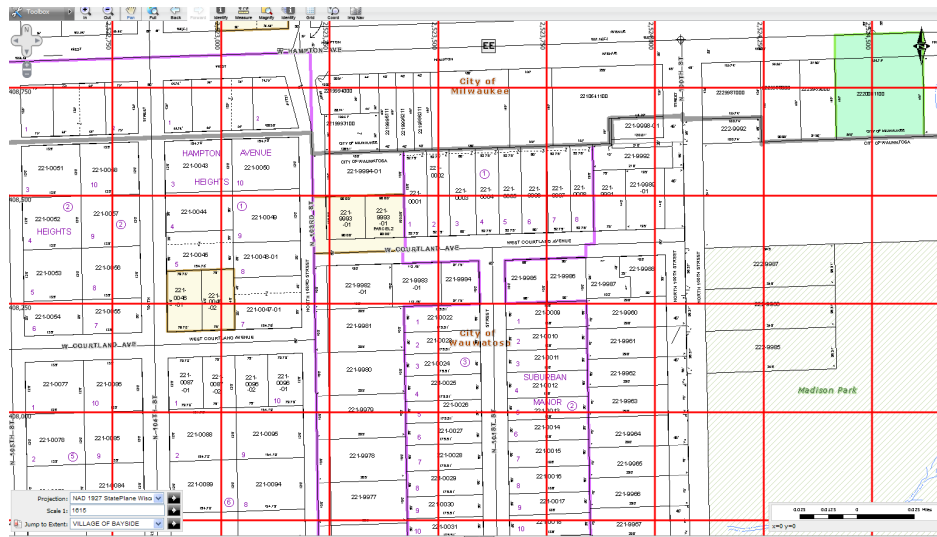
The Identify Visible Features tool identifies features from all the layers that are currently visible. Click the tool and then click a location on the map to see the attributes of all the features that are visible at that location.

Map Grid



The Map Grid tool allows you to overlay map layers with a user-defined grid. Click the Map Grid tool to open the Map Grid window and specify the size of the grid. Figure 2b-1 gives an example of a map window overlaid with a user-defined grid (in red).

Figure 2b-1: Map with Grid



Zoom to Coordinates



The Zoom to Coordinates tool allows you to zoom and center the map at a location that matches the user's specified coordinates. Coordinates may be entered as latitude & longitude, degrees, minutes, & seconds (DMS), or as map units (State Plane X & Y coordinates in U.S. Survey Feet). Click the Zoom to Coordinates tool to open the Zoom to Coordinates window and enter the coordinates. The map will zoom to and label the coordinates on the map.

Scale and Jump to Extent

Another method of zooming uses the Scale Box (Figure 2b-2) displayed at the bottom of the Map Window. The current map scale is always displayed as a ratio in this box. To change the scale, enter the desired ratio and press 'Go.' This is a quick way to automatically zoom directly to the scale you need to display a location of interest. For cartographic (map appearance & design) purposes, some map layers and their associated labels have limits on the scales at which they are visible. If the layer you need is unavailable at your current map scale, change the ratio in the Scale Box until the layer becomes available, or click on the layer name and select the "Zoom to visible scale" layer action (Section 2c).

The Jump to Extent tool in the Scale input box allows you to automatically zoom to and center the map on the extent of one of Milwaukee County's 19 municipalities.

Figure 2b-2. The Scale Input Box and Jump to Extent

Scale 1: 225089

Jump to Extent: VILLAGE OF BAYSIDE

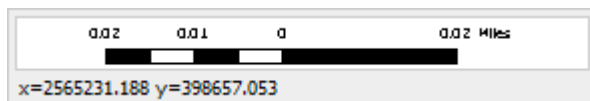
VILLAGE OF BAYSIDE
VILLAGE OF BROWN DEER
CITY OF CUDAHY
VILLAGE OF FOX POINT
CITY OF FRANKLIN
CITY OF GLENDALE
VILLAGE OF GREENDALE
CITY OF GREENFIELD
VILLAGE OF HALES CORNERS
CITY OF MILWAUKEE
CITY OF OAK CREEK
VILLAGE OF RIVER HILLS
CITY OF ST. FRANCIS
VILLAGE OF SHOREWOOD
CITY OF SOUTH MILWAUKEE
CITY OF WAUWATOSA
CITY OF WEST ALLIS
VILLAGE OF WEST MILWAUKEE
VILLAGE OF WHITEFISH BAY

Scale 1: 225089

Jump to Extent: VILLAGE OF BAYSIDE

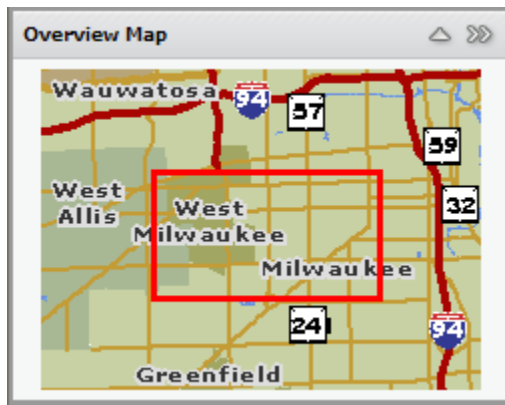
Along with the Scale Input Box, there is also a Scale Bar (Figure 2b-3) for estimating distances at the bottom of the Map Window. The Scale Bar also provides the cursor's location on the map in State Plane coordinates (U.S. Survey Feet from the point of origin of Wisconsin's south State Plane zone).

Figure 2b-3: The Scale Bar



Please note that the Scale Box and Scale Bar are for map navigation only, and offer limited accuracy. Without specific information about the size of each user's monitor or display device, it is impossible to implement a scale that matches every user's situation. Error will be most pronounced if you are operating a large monitor (or a projection device) running at a very low resolution, or if you are running a small monitor at a very high resolution. A 17" monitor running at a resolution of 800x600 or 1024x768 will optimally represent the scale indicated.

Figure 2b-4: Overview Map



The overview map (Figure 2b-5), located at the top of the Information Panel, provides another way of navigating around the map after you have narrowed down your area of interest and desired scale. If the Overview Map is not visible, click the arrow on the right side of the grey Overview Map bar. The box outlined in red represents the extent of the area that is visible in the Map Window. By grabbing and resizing the outline of the red box, the view in the Map Window re-centers on the area defined in the Overview Map.

2c. The Layer List, Layer Visibility, Layer Actions, & Making a Layer Active

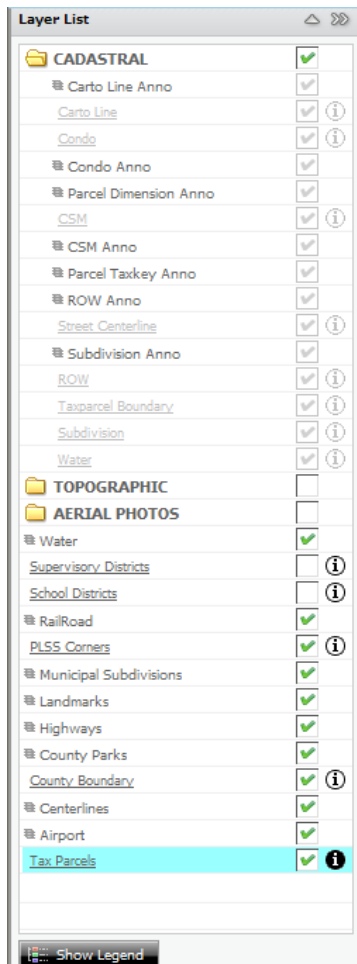
(Includes a New Tool with Version 2.0.1)

Because many layers are available in the map, some layers are organized into related folders on the Layer List (Figure 2c-1); if you don't see the Layer List, click on the arrow on right-hand side of the Layer List bar in the Information Panel. When you open a map, some folders may be open and some may be closed. Groups of layers, or folders, (such as Cadastral, Topographic, Aerial Photos, etc.) may be turned on and off by clicking on the checkbox to the right of folder name. Likewise, some layers may be turned on while others may be turned off by default.

To manually set the display of layers, you can open a closed folder by clicking on it. A list of all the layers contained within the folder will be shown. Similarly, you can click on an open folder to close it. Notice that opening and closing folders doesn't turn layers on or off; it simply helps keep the layer list uncluttered.

Next to each folder you will see a checkbox that indicates whether a layer is visible on the map. A layer is 'on' (displayed on the map) when there is a check in the checkbox. Toggle individual layers on and off by clicking an empty box to make the layer visible, or clicking a checked box to hide the layer.

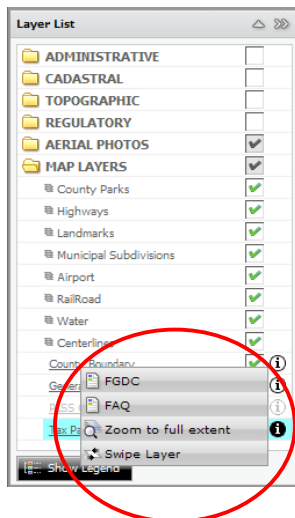
Figure 2c-1: The Layer List



Layer Actions

Functions and tasks (or “actions”) related to the properties of individual layers are provided where layer names are underlined in the layer list. To perform an action on a layer, left click the underlined name of a layer in the Layer List and select an action from the menu that appears a few moments later (Figure 2c-2).

Figure 2c-2: Layer Actions Menu



FGDC and FAQ Metadata

When available, metadata (or “data about data”) appears in a new browser window in either a “frequently asked questions” format or the Federal Geospatial Data Committee standardized format.

Zoom to Full Extent

The Zoom to Full Extent layer action zooms directly to the extent that is just large enough to show all the features in a layer. Note that this extent may be different from the provided by the Zoom to Full Extent tool in the Navigation Toolbox.




Swipe Layer (New with Version 2.0.1)

The Swipe Layer action allows users to swipe (or roll out of view) a layer to reveal the layer that lies underneath.

Making Layers Active

Some layers are only available at certain scales. Layers that are available at your current scale will be shown with a white identify icon (Figure 2c-3) next to the layer name, while layers that are unavailable at a given scale are shown with a grey identify icon (Figure 2c-3) next to the layer name. A layer can be made 'active' by clicking on the white icon adjacent to its name. A black identify icon (Figure 2c-3) will denote the active layer, and its name will be highlighted in blue in the Layer List. When a layer is active, features from that layer that are visible in the Map Window may be identified and selected.

Figure 2c-3: Layer Availability Icons

-  Available Layer
-  Active Layer
-  Lay Unavailable at Current Scale

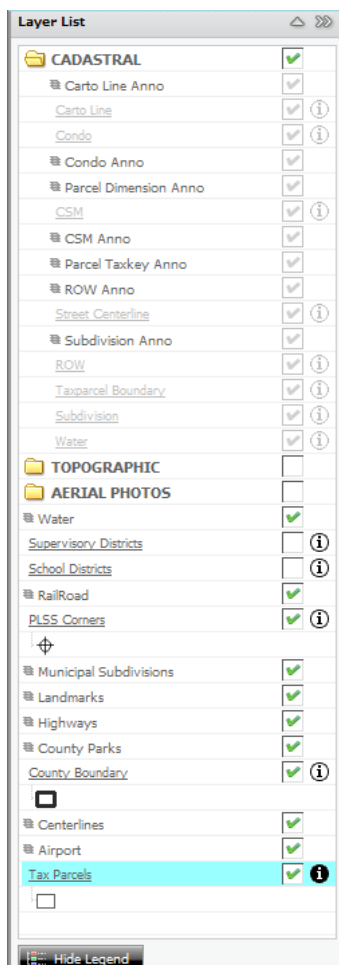
2d. Identifying Attributes of Features

As discussed in the Introduction to GIS, features (such as rivers or subdivisions) have attributes associated with them. Suppose you are interested in the attributes associated with a piece of real estate in a particular location to which you have zoomed. First, ensure that the “Tax Parcels” layer is the active layer (see Making Layers Active for more information). With the Identify tool (found in the Navigation Toolbox, Section 2b), click on a parcel polygon to “query” (examine associated attribute information) a property.

2e. Viewing the Map Legend

In addition to the functions above, the Layer List can also display a Map Legend. To make the legend visible, click on the ‘View Legend’ button at the bottom of the Layer List (Figure 2e-1). To hide the legend, click the ‘Hide Legend’ button. Legend symbols will only be visible for layers that are visible.

Figure 2e-1: Activate Layer List Legend



The following sections will show you how you can draw on and add your own data to a map, create your own custom maps as PDF documents (which you can save and/or print), measure distances, search for and select features based on various criteria, export data, and more.

3) More Advanced Functions

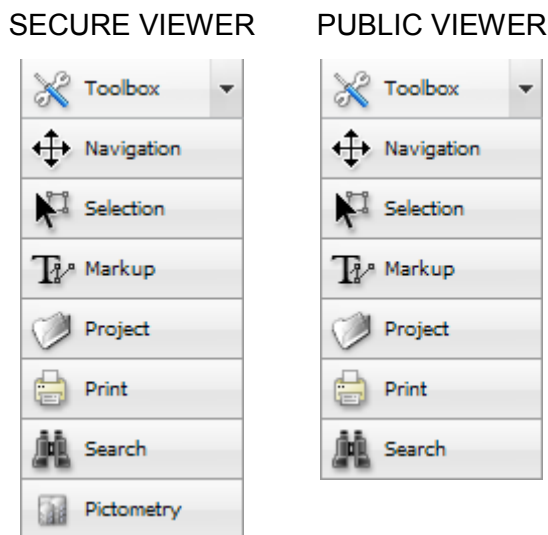
3a. Tools and Tasks Overview

This section will introduce you to the different tools and functions available with the Interactive Mapping Service. Please note that some tools may not be available with the general-access Public Viewer (Figure 3a-1).

The Toolbox Menu

The Toolbox Menu (Figure 3a-1), located at the top of the main map window, contains the groups of Toolbars that are available for interacting with your map. Click on a Toolbar name in the Toolbox drop-down menu to reveal a set of tools that are specific to a desired task or function.

Figure 3a-1: The Toolbox Menu



3b. The Selection Toolbar



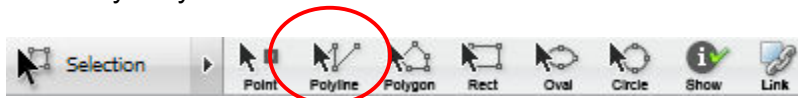
The Selection Toolbar provides tools for selecting and identifying various features on your map. There are a number of Select Feature tools that provide you with different ways of creating collections of map objects, or 'selection sets.' Choose the tool from the list of options below that will allow you to select your map objects in the easiest or most accurate way. Once you have selected features using one of these tools, you can see attribute reports and take advantage of additional options available in the Selection Results window (Figure 3g-1).

Select by Point



Select single features with this tool by clicking on the map in a particular location.

Select by Polyline



Use this selection tool to select a group of features from the map. Click on the map to start your polyline. Click again wherever you want to add a node and change the direction of the line. Double click to add the final node and complete the line.

Select by Polygon



A polygon is drawn like a polyline. Click on the map to mark the start/end point of your polygon, click again anywhere you want to add a node, and double click the last node to finish.

Select by Rectangle



Click and hold the mouse button to mark the upper left corner of your rectangle. Drag the mouse to size your rectangle and release when done.

Select by Oval



Click the mouse on the map to start your oval and move the mouse to resize. Click again to complete your shape.

Select by Circle



Click the mouse to mark the center of your circle. Move the mouse to resize your shape and click again to finish.

Show Selection Summary



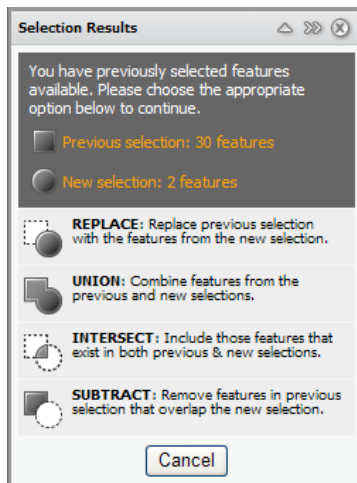
The Show tool displays a summary of all the selected features in the Selection Results window (Figure 3g-1).

Hyperlink



The Hyperlink tool offers the ability to associate a layer's spatial data with links to external data, such as web pages and documents. Once the tool is selected, click on a point on the map to search for existing feature links. The Feature Hyperlinks window will display the list of available feature links for the layer that you queried.

Figure 3b-1: Selection Results Options



Each time you select a group of features, a “selection set” is created. If you select additional features when a selection set (or a group of selected features) has already been created, options are presented (Figure 3b-1) to give you control over how your new selection set will interact with any previously-selection features.

3c. The Markup Toolbar



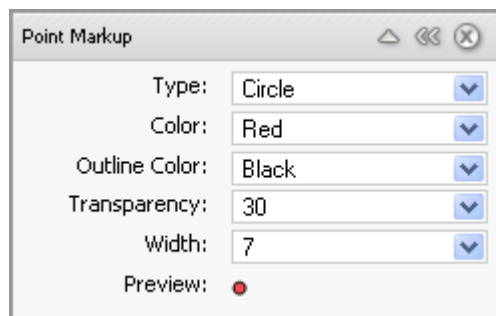
The Markup Toolbar allows you to add points, lines, areas and text to your map. There is a separate tool for each of the six types of geometries that can be used to add your own shapes to the map, as well as many options for changing the properties of your markup (e.g. fill type, color, transparency, line width).

Point Markup



To add points to your map, click on the Point Markup tool in the toolbar and define the appearance of your point from the Point Markup menu (Figure 3c-1) that appears in the Information Panel. After defining the appearance of your point, click on the map location where you wish to insert the point.

Figure 3c-1: Point Markup Menu Options

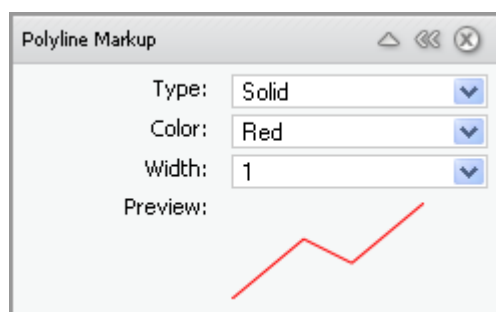


Polyline Markup



Draw a line on your map by selecting the Polyline Markup tool. Define the appearance of your line from the drop-down menus in the Polyline Markup menu (Figure 3c-2), and then click on the map to mark a starting point for your line. Move the mouse begin drawing and click wherever you want to add a node to your line and begin a new segment. If you make a mistake, right-click to undo the previous node. Double-click to add the final node and complete your line.

Figure 3c-2: Polyline Markup Menu Options

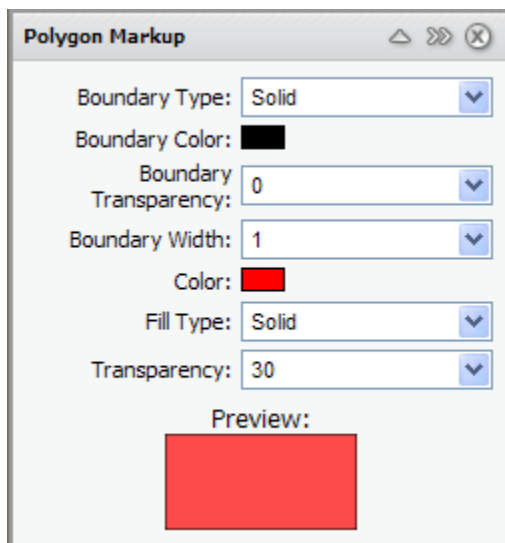


Polygon Markup

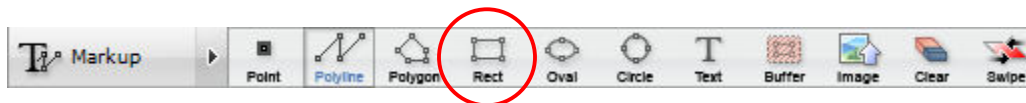


To draw a polygon with 3 or more sides, select the Polygon Markup tool and choose the attributes of your polygon from drop-down menus in the Polygon Markup menu (Figure 3c-3). Click once on the map to mark a start/end point for your polygon. Next, add at least 2 more points by clicking on the map in the desired locations. If you make a mistake, right-click to undo the previous node. Double-click to draw your last node and finish the polygon.

Figure 3c-3: Polygon Markup Menu Options (rectangle, oval, and circle markup menus are similar)



Rectangle Markup



To add a rectangle to your map, select the Rectangle Markup tool and choose the attributes of your shape from the options provided in the Rectangle Markup menu (similar to the Polygon markup menu in Figure 3c-3). To start and position your rectangle, click and hold the mouse button down on the desired map location. Drag the mouse to size the box and release the mouse button to complete the rectangle.

Oval Markup



Draw an oval on your map using the Oval Markup tool. Select the tool and choose the features of your shape from the options in the Oval Markup menu (similar to the Polygon markup menu in Figure 3c-3). Click on the map to position the corner of your oval and drag the mouse in any direction until you reach the desired size. Click again to complete the oval.

Circle Markup



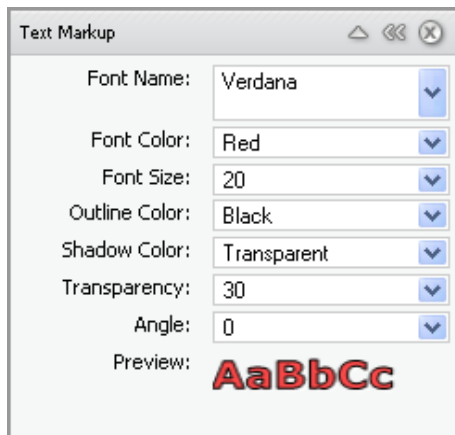
To create a circle, choose the Circle Markup tool and select attributes from the drop-down options in the Oval Markup menu (similar to the Polygon markup menu in Figure 3c-3). Next, click the map to set the center position of your circle. Move the mouse away from the point to enlarge the circle and towards the point to shrink it. To complete the shape, click the mouse again.

Text Markup



The Text Markup tool allows you to add text directly to the map. Select the Text tool and format your text with the font and style options provided in the Text Markup menu (Figure 3c-4). Click the location on the map where you want your text to begin and type within the text box. Press 'OK' to finish and add the text to your map, or press 'Cancel' to start again.

Figure 3c-4: Text Markup Menu Options

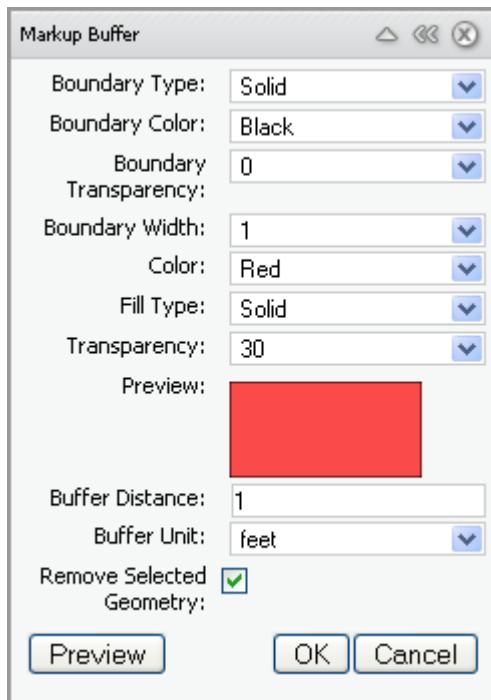


Buffer Markup



Use the Buffer Markup tool to create buffers around shapes drawn using the Markup tools. Once the Buffer Markup tool is active, click on the map and drag your mouse to draw a rectangle around any shapes you want to use for creating buffers. Once the shapes are selected, specify the symbology of your buffers (including buffer distance and unit of measurement) in the Markup Buffer menu (Figure 3c-5). You can choose to have the original shapes be displayed or removed after the buffer is created by selecting or deselecting the checkbox at the bottom of the Markup Buffer screen.

Figure 3c-5: Buffer Markup



Upload Image to Markup



The Upload Image to Markup tool allows you to add an image in one of four common file formats to your map.

Clear All Markup



To quickly erase all existing markups from the map, select the Clear All Markup tool. A pop-up window will ask you if you want to delete all markups in your map. Press 'OK' to continue or 'Cancel' to abort the function.

Erase Markup



The Erase Markup tool allows you to delete selective markup that you have made on the map. Select the tool and click once on any added text or graphic to erase the selected markup. To erase multiple graphics at once, you can click and drag the mouse to create a box around added text or graphics. Release your mouse button when the box encloses the markup you want to erase. Note that when a section or portion of a graphic is enclosed within the eraser box, the entire shape is deleted.

Markup Swipe



In some cases, markups may obscure details in the map. To allow the user to temporarily roll a markup back to see what is underneath, the Swipe tool is provided. To use, hold drag your mouse over a markup feature while holding down your mouse button.

3d. The Project Toolbar



The Project Toolbar allows you to add your own GIS data to the map, save a marked-up map as a project using one of several methods, or open a previously created map project.

Save Project (available only in the Secure Viewer)



The Save Project tool allows you to save a mapping session for later use or reference. Click the Save Project tool to save your current map viewer extent, layer configuration, and any added mark-up to be accessed at a later date. You can choose to copy the Project ID for future use, or download your project file and open it later using the Open Project tool. You can also copy the hyperlink provided to open your project in a browser window, as well as use the URL for emailing or adding to your map browser favorites. Once a project is saved, it cannot be overwritten (saved again with the same name).

PROJECT ID: **Your_Project**

Project URL: http://maps.milwaukeecounty.org/Geocortex/Essentials/Web/Viewer.aspx?Project=Your_Project

You will need to remember the name you gave to your map project to return to it later; click “Copy Project ID” or “Copy Project URL” (Figure 3d-1) and paste these into Notepad or Word to aid you in remembering your map project’s name.

Open Project (available only in the Secure Viewer)



The Open Project tool allows you to open a previously saved map session. To reopen a map session, select the Open Project tool and locate your project in one of two ways. You can enter the Project ID of a saved project and hit ‘Submit,’ or you can click ‘Browse’ to search for a project that was downloaded to your computer, and then press ‘Upload’ to open the file (Figure 3d-1).

Figure 3d-1: Save Project and Open Project Panels

The image shows two side-by-side dialog boxes. The left dialog box is titled 'Save Project' and contains instructions on how to save a project, including a text input field for 'Your_Project', a 'Copy Project ID' button, and a 'Copy Project URL' button. The right dialog box is titled 'Open Project' and contains instructions on how to open a project, including a text input field for 'Your_Project', a 'Submit' button, a 'Browse...' button, an 'Upload' button, and a 'Cancel' button.

Export



The Export tool in the Project toolbar provides a quick way to create a “snapshot” of the portion of your map that is visible in the Map Window, along with any markups. Select the desired image format and resolution in the dialog box that is presented (Figure 3d-2), hold down your Ctrl key to avoid popup blocker interference, and click “Open Image.” To save the exported image after it appears in a new browser window, right click on the image, select “Save Picture As,” and save image to the location of your choice.

Figure 3d-2: The Export Tool in the Project Toolbar

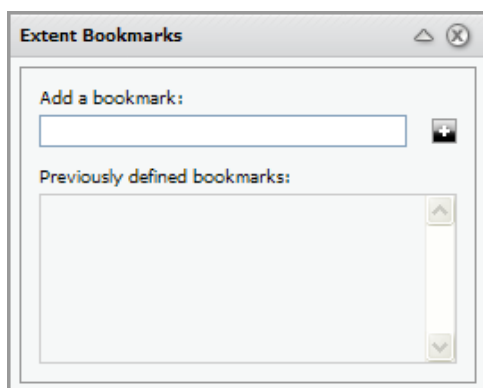
The image shows a dialog box titled 'Export Map Image'. It contains instructions: 'Use the options below to create an image file from the map currently being displayed.' Below this, there are two dropdown menus: 'Format' set to 'Png' and 'Resolution' set to '72 dpi'. At the bottom of the dialog box is a button labeled 'Open Image'.

Bookmark



The Bookmark tool in the Project toolbar provides a quick way to return to the extent of a previously viewed area of interest. Enter a name for your area of interest and click the black button (Figure 3d-3). Any bookmarks added will appear in the “Previously defined bookmarks” box. To return to an extent, click the Bookmark tool and select one of the available bookmarks.

Figure 3d-3: The Bookmark Tool in the Project Toolbar



Upload Shapefile



At times, you may find it useful to view your own GIS data along with the layers available in the Interactive Mapping Service. The Upload Shapefile tool allows you to upload a shapefile and display its features as a layer within your map. This layer will function the same way as other map layers, allowing you to perform all the same operations (navigating the layer, identifying and selecting features, viewing legend, etc.) as well as save the layer and all associated markup as part of a saved project. To use this function, select the Upload Shapefile tool from the toolbar. Next, fill in the requested information in the Upload Shapefile window that appears (Figure 3d-4), including the name and color of the new layer, along with the file paths for the three files that constitute a basic Shapefile (.shp, .dbf, .shx).

Figure 3d-4: The Upload Shapefile Panel

Upload Shapefile

This form allows you to upload a Shapefile and add it to the map as a graphics layer. Enter the name of the layer to create, the color with which to draw its symbols, and the locations of the three required Shapefile files: .shp, .shx and .dbf.

Note: The combined size of the three Shapefile files must not exceed 20480 KB. Also, if the Shapefile's projection information does not match that of the map, the Shapefile's geometry may appear out of position.

Layer Name:

DBF File:

SHP File:

SHX File:

3e. The Print Toolbar



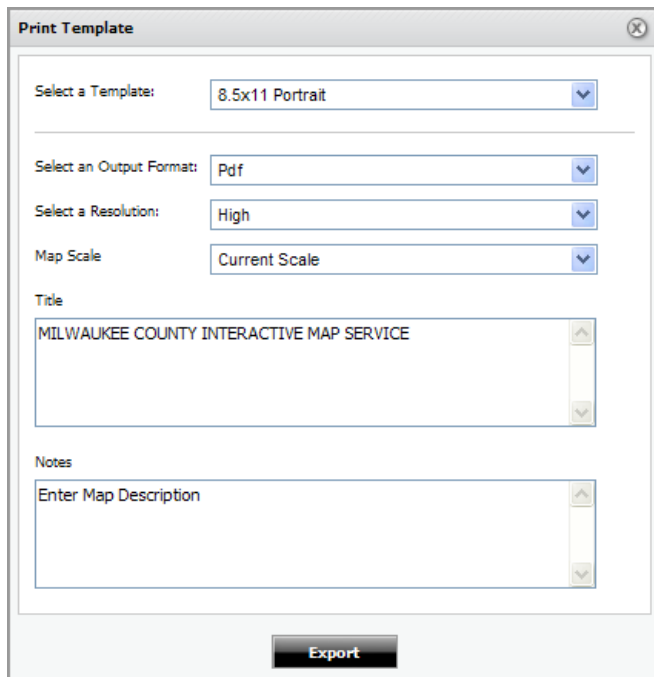
The Print Toolbar creates a print version of a map using a preset layout, with an accurate scale and legend.

Print Map Template



The Print Map Template allows you to export a printable map using a variety of pre-defined sizes/formats and file types. In the example in Figure 3e-1, after selecting a template from the drop-down list ("8.5x11 Portrait"), you are presented with options for customizing your map: map document resolution, title & notes, desired output format, and scale. Clicking on "Export" will prepare your printable map document for download. When your document is ready, you will be prompted to download the file.

Fig 3e-1: Print Map Template



The 'Print Template' dialog box contains the following fields and controls:

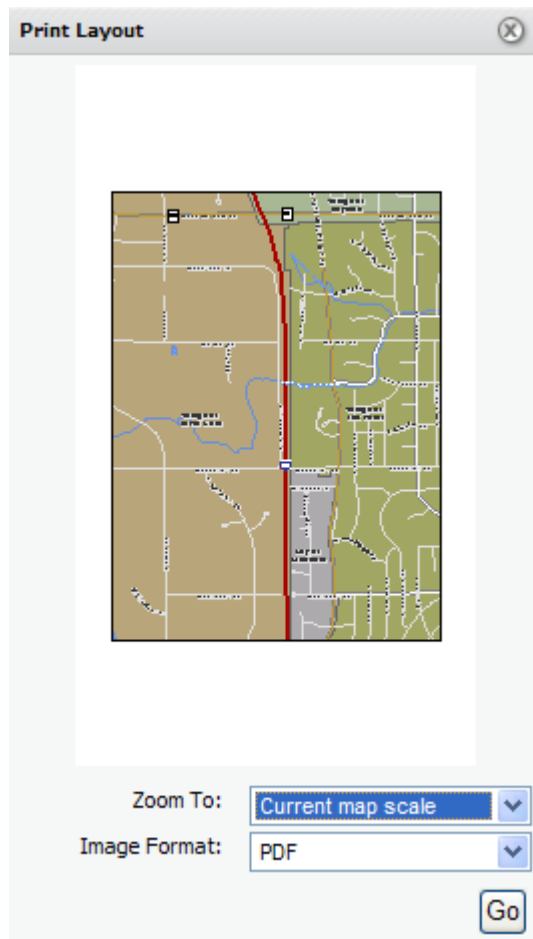
- Select a Template:** A dropdown menu with '8.5x11 Portrait' selected.
- Select an Output Format:** A dropdown menu with 'Pdf' selected.
- Select a Resolution:** A dropdown menu with 'High' selected.
- Map Scale:** A dropdown menu with 'Current Scale' selected.
- Title:** A text input field containing 'MILWAUKEE COUNTY INTERACTIVE MAP SERVICE'.
- Notes:** A text input field with the placeholder text 'Enter Map Description'.
- Export:** A button located at the bottom right of the dialog.

Print Layout (Available only in the Secure Viewer)



To print an image of your map, select the Export tool. The 'Zoom To' drop-down menu allows you to select either the current map scale, the current map extent, or a standard map scale as the map area (Figure 3e-2). Choose the format you want for your map image and press 'Go.' An image of your map will be exported to a browser window, where it can be printed.

Figure 3e-2: Print Layout



3f. The Search Toolbar *(Includes New Tools with Version 2.0.1)*



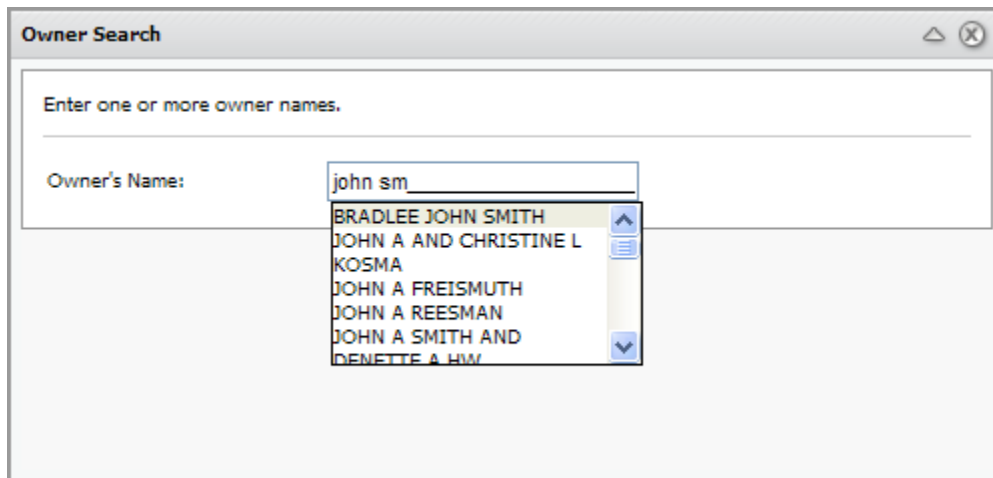
The Search Toolbar is used to locate land parcels on the map via owner name, address, or taxkey. After searching with any of the following tools, you'll find your results displayed in the Selection Results window (Figure 3g-1).

Search for Parcels by Owner



The Owner Search tool searches for parcels based on the owner's name. Select the Owner Search tool from the Search toolbar. Type your search term into the Owner Name field in the Owner Search dialogue box (Figure 3f-1). Enter at least the owner's last name and click "Search." As you type in a search string, an "auto complete" feature populates a list of owner names that are similar to your search string. Any parcel results for that search will now be selected in the Tax Parcels layer. The Selection Results window (Figure 3g-1) will appear and allow you to request various reports based on the selected parcels.

Figure 3f-1: Owner Search Dialogue Box



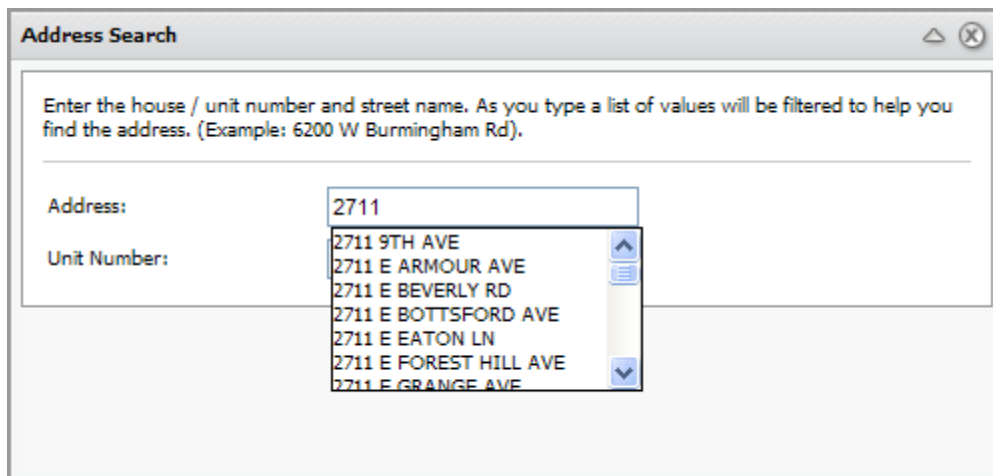
The 'Owner Search' dialog box features a title bar with a maximize button and a close button. Below the title bar is a text input field with the placeholder text 'Enter one or more owner names.' Below this is a label 'Owner's Name:' followed by a text input field containing 'john sm'. A dropdown menu is open below the input field, displaying a list of names: 'BRADLEE JOHN SMITH', 'JOHN A AND CHRISTINE L KOSMA', 'JOHN A FREISMUTH', 'JOHN A REESMAN', 'JOHN A SMITH AND', and 'DENETTE A HW'. The list is scrollable with up and down arrow buttons on the right side.

Search for Parcels by Address



The Address Search tool searches for parcels based on the address of those parcels. Select the Address Search tool from the Search toolbar. Type your search term into the Owner Name field in the Owner Search dialogue box (Figure 3f-2). As you type in a search string, an “auto complete” feature populates a list of addresses that are similar to your search string. Any parcel results for that search will now be selected in the Tax Parcels layer. The Selection Results window (Figure 3g-1) will appear and allow you to request various reports based on the selected parcels.

Figure 3f-2: Address Search Dialogue Box



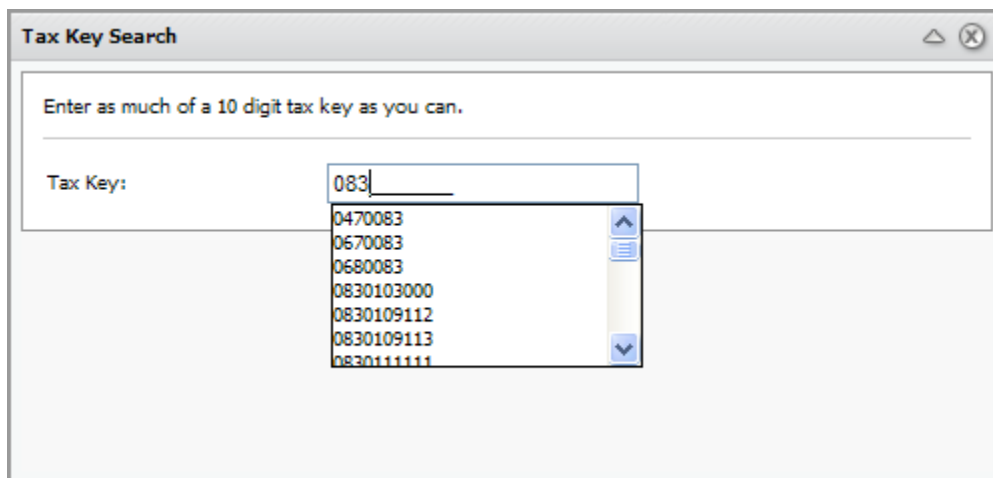
The 'Address Search' dialog box has a title bar with a maximize button and a close button. Below the title bar is a text input field with the placeholder text 'Enter the house / unit number and street name. As you type a list of values will be filtered to help you find the address. (Example: 6200 W Birmingham Rd)'. Below this is a label 'Address:' followed by a text input field containing '2711'. A dropdown menu is open below the input field, displaying a list of addresses: '2711 9TH AVE', '2711 E ARMOUR AVE', '2711 E BEVERLY RD', '2711 E BOTTSFORD AVE', '2711 E EATON LN', '2711 E FOREST HILL AVE', and '2711 E GRANGE AVE'. The list is scrollable with up and down arrow buttons on the right side.

Search for Parcels by Tax Key



The Taxkey Search tool searches for and selects parcels by tax key. Select the Tax Key Search tool from the Search toolbar, type the tax key of interest (without dashes and no fewer than 7 characters yet no more than 10 characters) in the Tax Key field of the Tax Key Search dialogue box (Figure 3f-3). As you type in a search string, an “auto complete” feature populates a list of tax keys that are similar to your search string. After clicking “Search,” the Selection Results window (Figure 3g-1) will appear and allow you to take additional action with any selected parcel(s).

Figure 3f-3: Tax Key Search Dialogue Box



Search Administrative Layers *(New with Version 2.0.1)*



The Search Administrative Layers tool allows users to quickly search for and locate features related to Milwaukee County administrative entities such as supervisory districts and school districts.

In the dialogue box that appears after clicking the tool, choose the layer of interest from the drop-down that appears first (Figure 3f-4). Another drop-down list then appears with available attributes from which specific values may be chosen. For school districts, one attribute (DISTRICT) is presented, along with a drop-down list to the right that includes all available school districts by name (Figure 3f-5). When the supervisory districts layer is chosen, two attributes are presented from which specific values are selected: 1) “DISTRICT” with a list of supervisory district numbers (Figure 3f-6), and 2) “SUPERVISOR” with a list that includes every supervisor’s name (Figure 3f-7).

After a school district name, supervisory district number, or supervisory district name is chosen, a report window appears that provides a summary of information related to the chosen administrative feature along with additional tools for zooming to the feature on the map and adding the feature to a selection set.

Figure 3f-4: Administrative Layers Search Dialogue

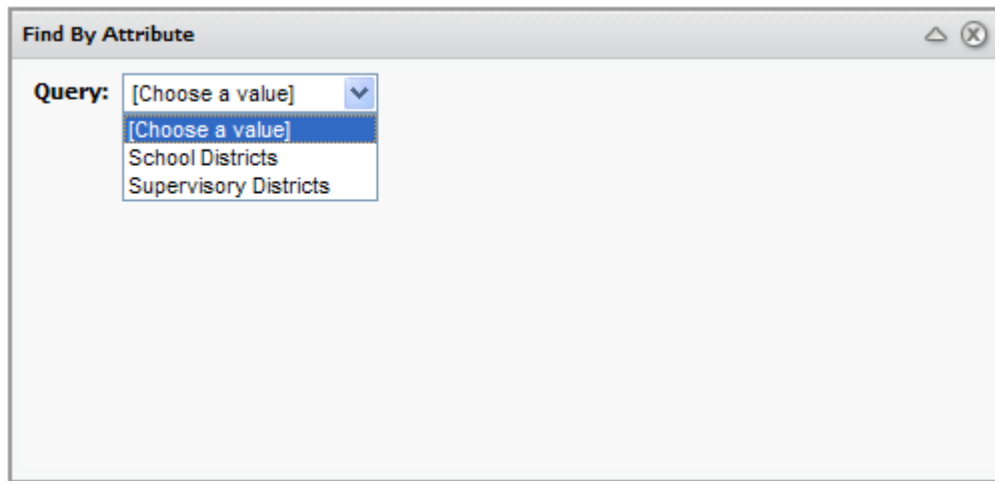


Figure 3f-5: Administrative Layers Search Dialogue, School District Name

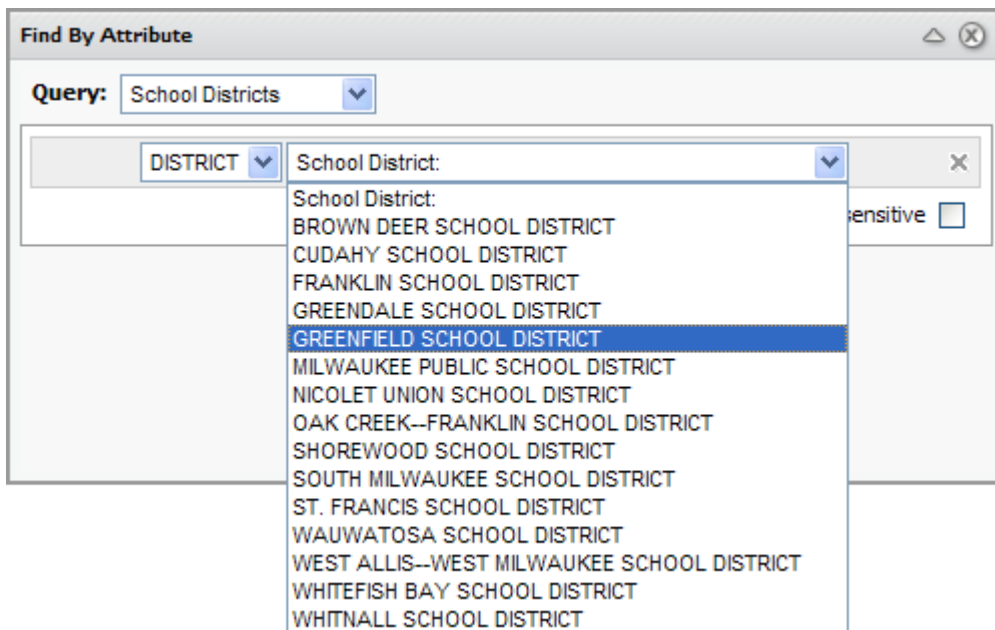


Figure 3f-6: Administrative Layers Search Dialogue, Supervisory District Number

Find By Attribute

Query: Supervisory Districts

DISTRICT Supervisory District:

DISTRICT

SUPERVISOR

Query is case sensitive ☐

Execute

Find By Attribute

Query: Supervisory Districts

DISTRICT Supervisory District:

Supervisory District:

Supervisory District 1

Supervisory District 10

Supervisory District 11

Supervisory District 12

Supervisory District 13

Supervisory District 14

Supervisory District 15

Supervisory District 16

Supervisory District 17

Supervisory District 18

Supervisory District 19

Supervisory District 2

Supervisory District 3

Supervisory District 4

Supervisory District 5

Supervisory District 6

Supervisory District 7

Supervisory District 8

Supervisory District 9

Query is case sensitive ☐

Figure 3f-7: Administrative Layers Search Dialogue, Supervisor Name

Find By Attribute

Query: Supervisory Districts

SUPERVISOR
DISTRICT
SUPERVISOR

Supervisor Name:

Query is case sensitive

Execute

Find By Attribute

Query: Supervisory Districts

SUPERVISOR

Supervisor Name:

Supervisor Name:

Christopher J. Larson
Elizabeth M. Coggs
Gerry P. Broderick
Jim "Luigi" Schmitt
Joe Sanfelippo
John F. Weishan, Jr.
Johnny L. Thomas
Joseph Rice
Lee Holloway
Lynne De Bruin
Marina Dimitrijevic
Mark A. Borkowski
Michael Mayo, Sr.
Patricia Jursik
Paul M. Cesarz
Peggy A. West
Theodore A. Lipscomb
Toni M. Clark
Wille Johnson, Jr.

Query is case sensitive

Search Cadastral Layers *(New with Version 2.0.1)*



The Search Cadastral Layers tool allows users to quickly search for and locate features within cadastral-related layers. Currently, the condominium, CSM, and subdivision layers are available for use with this tool.

In the dialogue box that appears, choose the layer of interest from the drop-down list (Figure 3f-8). After a layer is chosen, another drop-down list appears with available attributes from which specific values may be chosen. Currently, the “NAME” attribute is available for each of the three searchable cadastral layers (Figure 3f-9).

After a condo, CSM, or subdivision name is chosen, a report window appears that provides a summary of information related to the chosen features along with additional tools for zooming to the feature on the map and adding the feature to a selection set.

Figure 3f-8: Cadastral Layers Search Dialogue

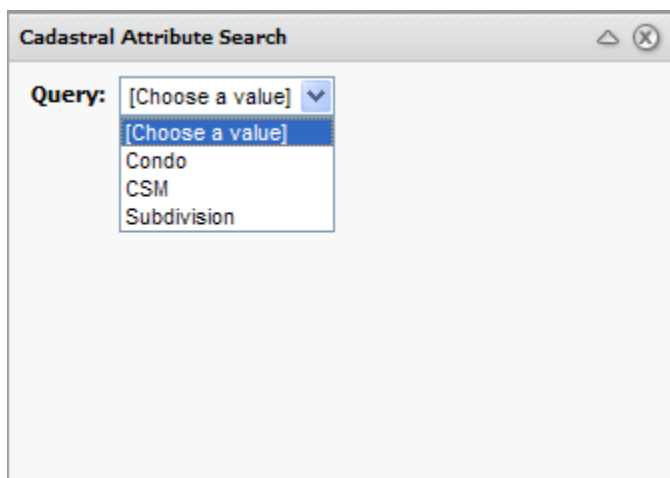
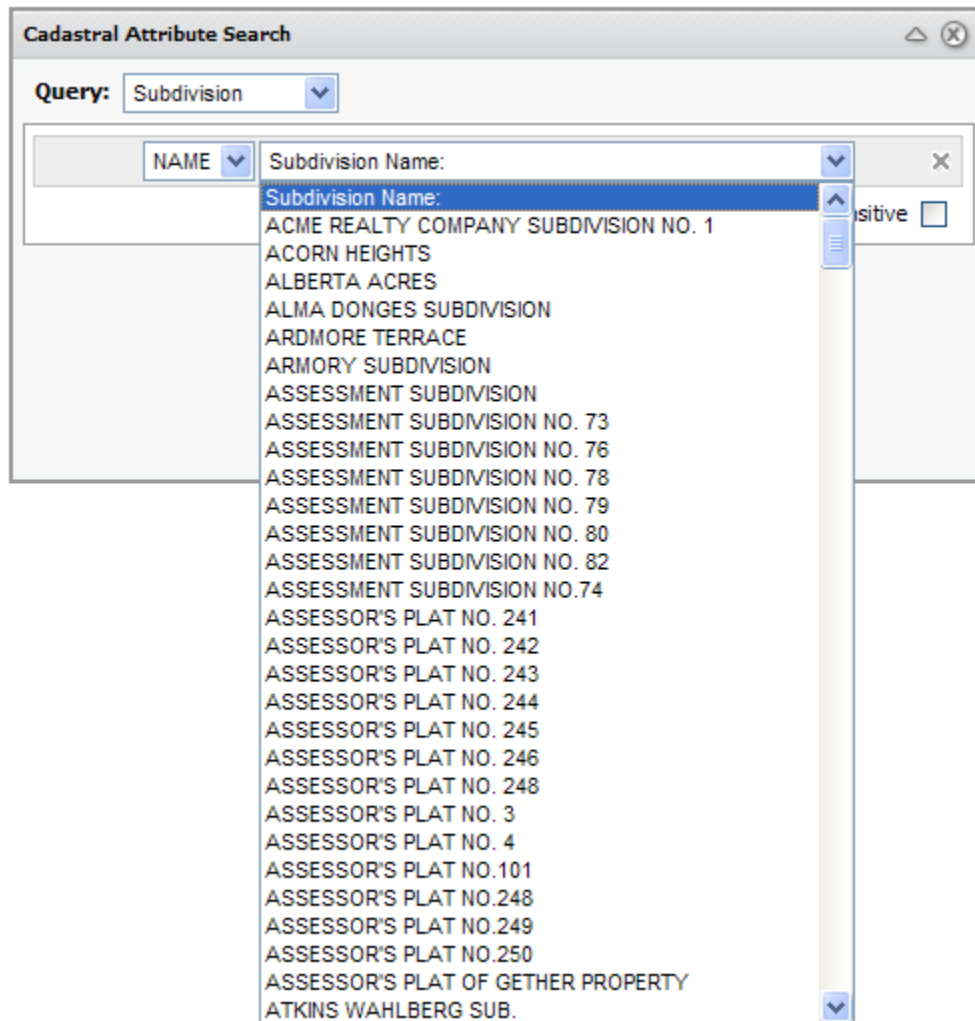


Figure 3f-9: Subdivision Name Search Dialogue (Condo and CSM name searches are similar)

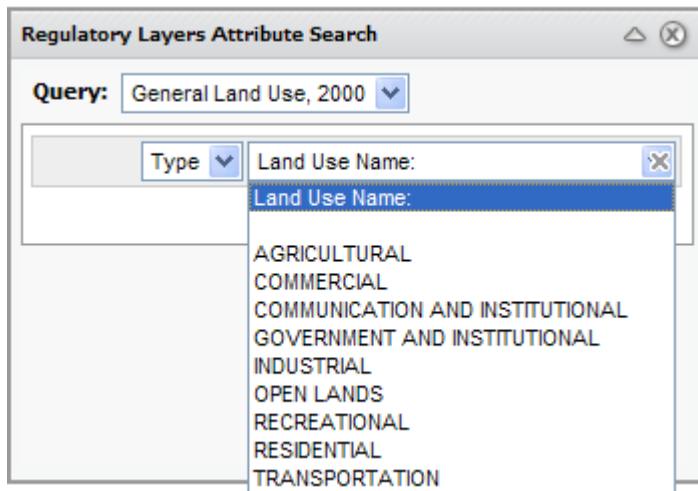


Search Regulatory Layers *(New with Version 2.0.1)*



The Search Regulatory Layers tool allows users to quickly search for and locate features within available regulatory-related layers. Currently, features within the general land use category from the land use layer may be located using the tool (Figure 3f-10).

Figure 3f-10: Regulatory Layers Search Dialogue



Search Map Layers (New with Version 2.0.1)



The Search Map Layers tool allows users to quickly search for and locate features within general reference map layers. Currently, features within the county parks, landmarks, and PLSS (Public Land Survey System) grid layers may be located using the tool.

In the dialogue box that appears, choose the layer of interest from the drop-down list (Figure 3f-11). After a layer is chosen, another drop-down list appears with available attributes from which specific values may be chosen. Currently, the “NAME” attribute is available for the county parks and landmarks layers, while “QuarterSectionID” is the attribute from which features in the PLSS Grid layer may be chosen (Figure 3f-12).

After a park, landmark, or quarter section is chosen, a report window appears that provides a summary of information related to the chosen features along with additional tools for zooming to the feature on the map and adding the feature to a selection set.

Figure 3f-11: Map Layers Search Dialogue

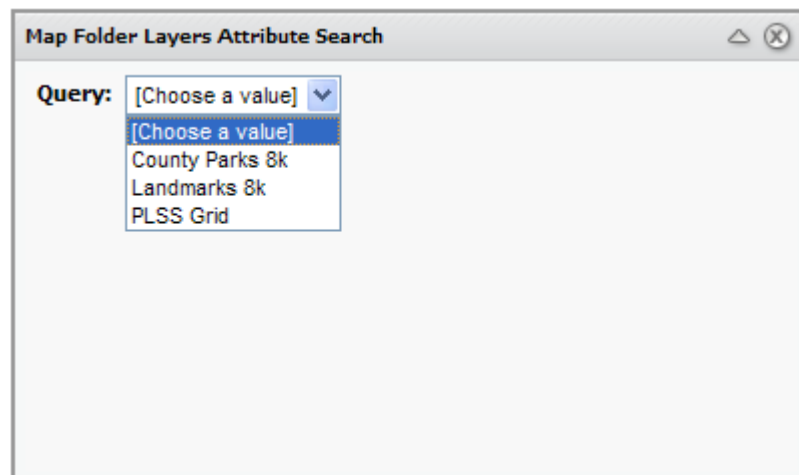
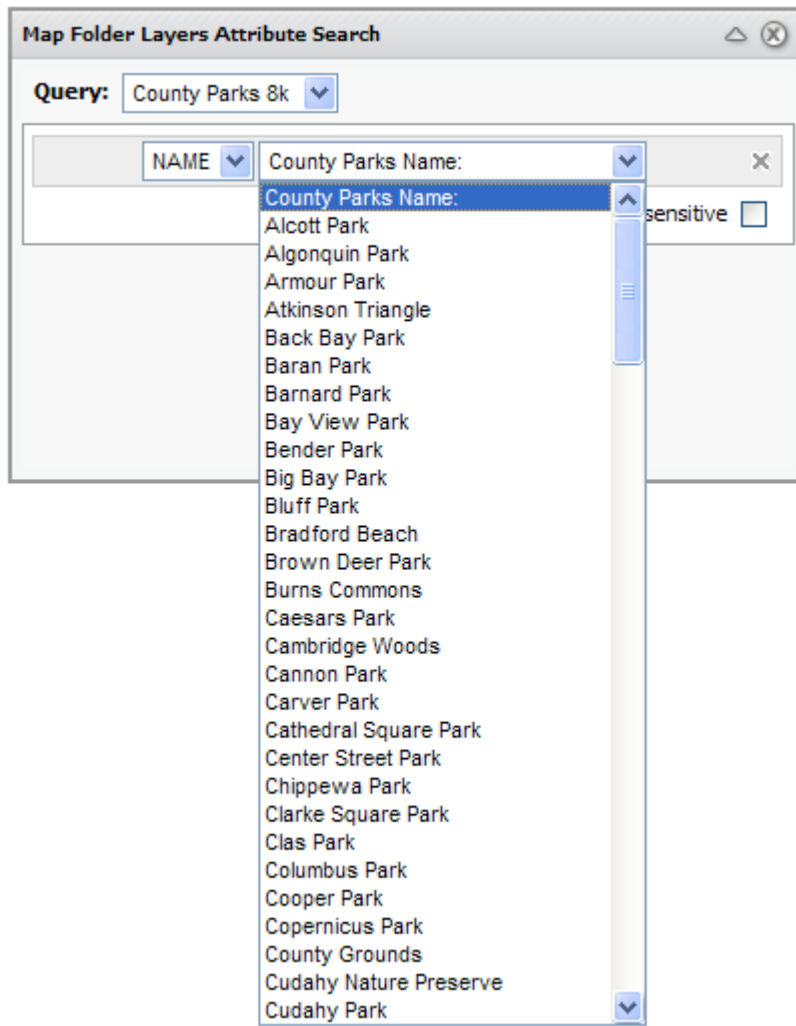
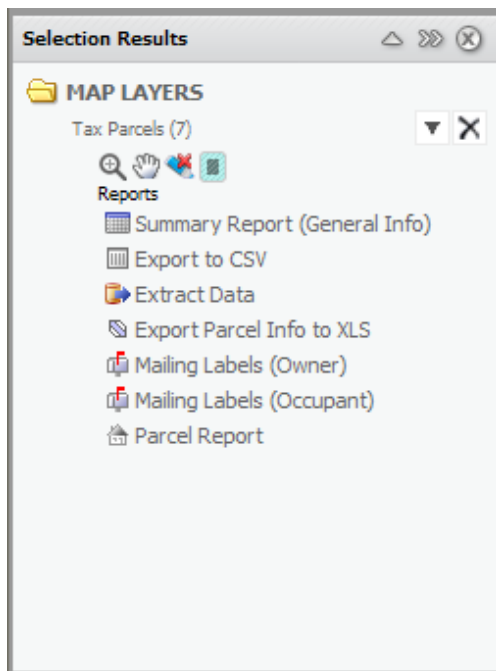


Figure 3f-12: Park Name Search Dialogue (Landmark and Quarter Section searches are similar)



3g. The Selection Results Window, the Summary Report, & the Detailed Report

Figure 3g-1: The Selection Results Window



The Selection Results Window (3g-1) appears at the bottom of the Information Panel when features are selected from the active layer; it provides several options for viewing and exporting data of selected parcels.

Attribute Data Exporting

Two ways to export and download the raw attribute data of selected parcels are provided:

- An Excel spreadsheet (Export Parcel Info to XLS)
- A comma-separated values file (Export to CSV)

Mailing Labels

Using the "Mailing Label" functions, users may generate mailing labels in one of two ways: by property owner's name & address or by property occupant's name & address.

GIS Data Extraction

Users of the Secure Viewer that have the capability to work with GIS data on their desktops can take advantage of the "Extract Data" function to extract selected features into a downloadable feature class. Three vector formats are offered for compatibility with most commonly used GIS software packages:

- GDB (ESRI file geodatabase)
- MDB (ESRI personal geodatabase)
- Shapefile

Parcel Report

The Parcel Report option (Figure 3g-2) provides a letter-sized PDF document for each of the selected parcels that includes a summary of information, as well as an overview map and a snapshot of a selected parcel's location. A Parcel Report for an individual parcel of interest is also available through the Detailed Report (Figure 3g-3).

Figure 3g-2: Parcel Report Option from the Selection Results Panel

Milwaukee County Land Information Parcel Report

TAXKEY: 2480321000

Report generated 7/21/2009 11:45:18 AM



Parcel location within Milwaukee County



Parcel highlighted in blue

Parcel Information

TAXKEY: 2480321000

Owner(s): WARREN WATTS
EDNA M WATTS

Address: 4135 N 48TH ST

Municipality: Milwaukee

Acres: 0.11

Assessed Value: \$76,300

Parcel Description: RESIDENTIAL

Legal Description: PLEASANT GARDENS IN SE 1/4 SEC 2-7-21 BLOCK 4 LOT 9

Parcel Photo
Not Available



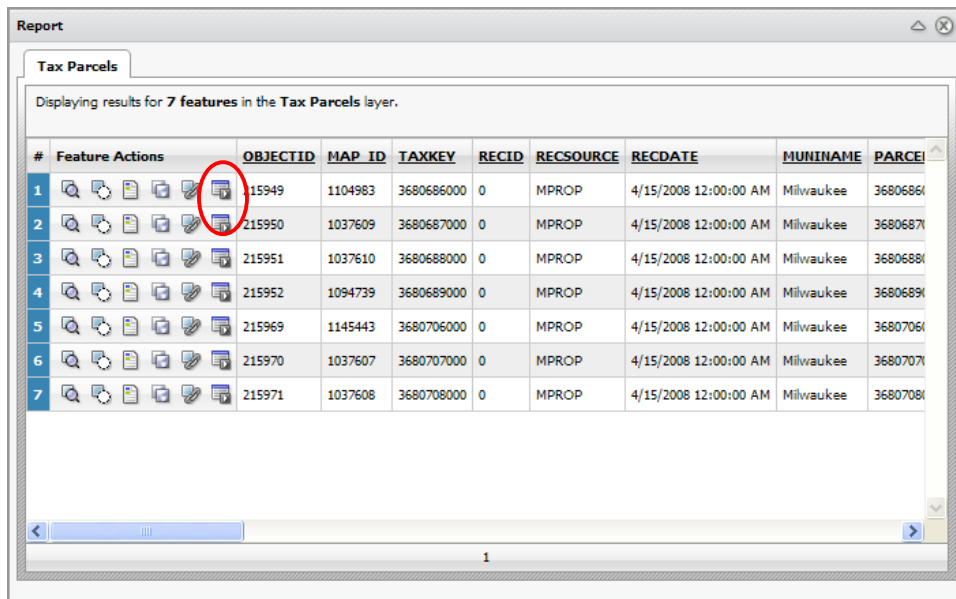
Parcel photo

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

The Summary Report (Figure 3g-3) provides a list of selected features and offers several ways to view the attribute data associated with the features in a selection set. The Summary Report window is presented in two situations:

- 1) When the search criteria used with the Administrative, Cadastral, Regulatory, or Map Layers Search tools (Search Toolbar, section 3f) matches two or more features.
- 2) Clicking on "Summary Report" in the Selection Results Window (Figure 3g-1) after features have been added to a selection set using the selection, search, query, find, or identification tools.

Figure 3g-3: Summary Report Option from the Selection Results Window



#	Feature Actions	OBJECTID	MAP_ID	TAXKEY	RECID	RECSOURCE	RECDATE	MUNINAME	PARCE
1	[Icons]	215949	1104983	3680686000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680686000
2	[Icons]	215950	1037609	3680687000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680687000
3	[Icons]	215951	1037610	3680688000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680688000
4	[Icons]	215952	1094739	3680689000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680689000
5	[Icons]	215969	1145443	3680706000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680706000
6	[Icons]	215970	1037607	3680707000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680707000
7	[Icons]	215971	1037608	3680708000	0	MPROP	4/15/2008 12:00:00 AM	Milwaukee	3680708000

The Detailed Report (Figure 3g-4) provides additional information for individual features in a selection set; it also provides additional tools and tasks:

- The Parcel Report option offers a PDF that summarizes basic information about an individual parcel of interest.
- Identified or selected parcels may be added to or removed from an existing selection set by clicking on the “Add to selection” or the “Remove from selection” buttons.
- The “Google Maps” button sends the user to a new browser window where the parcel’s location is presented in Google Maps (Figure 3g-5). A notable function offered by Google Maps is “street view” which offers the user a panoramic view along the street where a selected parcel is located.

The Detailed Report is presented in three situations:

- When the “View Report: Detail Report” button on the Summary Report window is clicked (Figure 3g-3) after features have been added to a selection set
- When individual features are identified using the Identify tool (Navigation Toolbar, section 2b)
- When the search criteria used with the Find or Query tools (Search Toolbar, section 3f) matches a single feature.

Figure 3g-4: Detailed Report

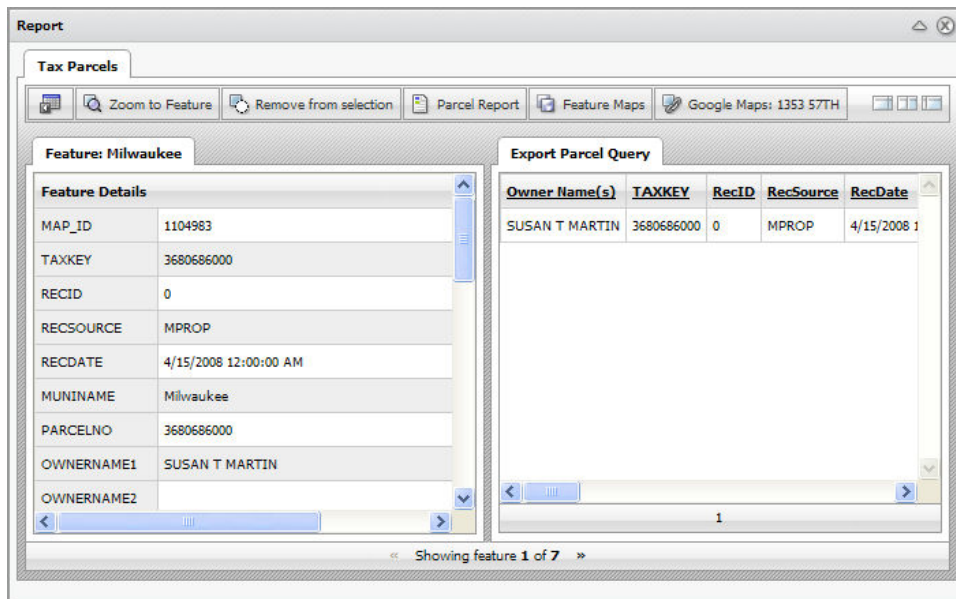
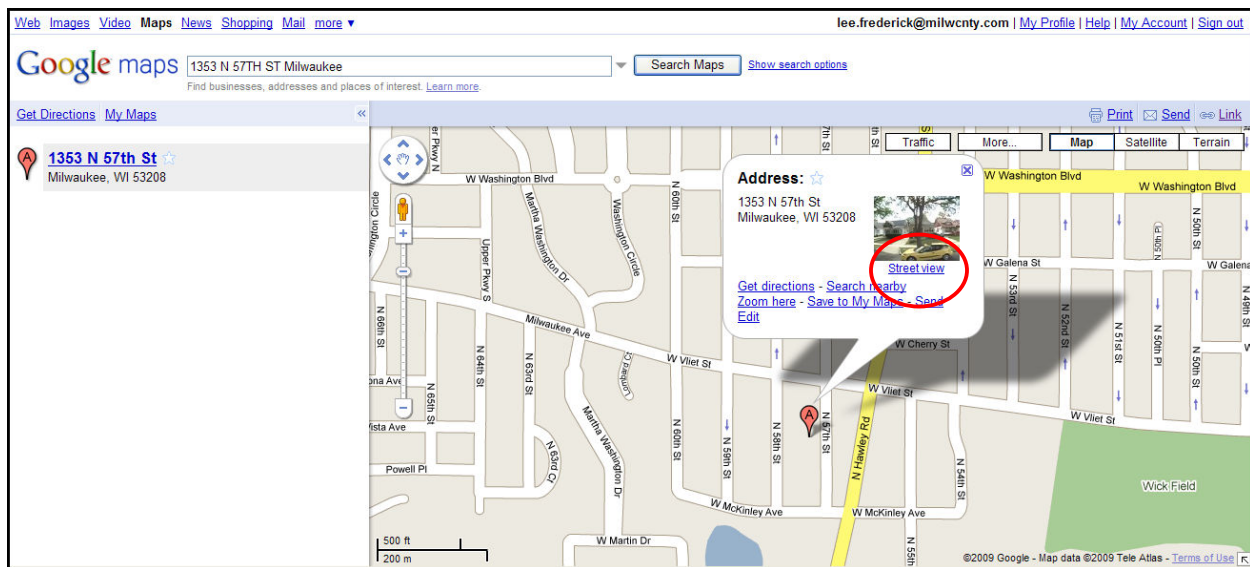


Figure 3g-5: Google Maps



3h. Pictometry Oblique Image Navigator (available only in the Secure Viewer)



An oblique image (sometimes called a “bird’s eye view”) is an aerial photograph that has been captured at approximately a 45° angle to allow a three-dimensional view of structures and land features. Oblique images differ from traditional aerial photography used in GIS, such as orthorectified imagery, which provide an orthogonal view (perpendicular to the ground).

Clicking on the “Img Nav” on the Pictometry Toolbar opens a new window below the main map window for viewing oblique imagery. A set of associated tools that allow you to work with oblique views of areas visible in the main Map Window is presented as part of the oblique image

viewing window. Click on a location in the main Map Window using the Identify tool (Navigation Toolbar) to display an oblique image of a feature's location.

Oblique Imagery: Pan



The Pan tool lets you move around to different parts of an oblique image. Grab a location on an image by holding down your left mouse button to move an image. When you reach the edge of an oblique image, click in the white space on either side of the image to view the next adjacent image.

Oblique Imagery: Identify



Use the Identify tool to select a point of interest from the oblique image and see a list of attributes associated with the parcel at the location. A Summary Report (Figure 3g-2) will appear with additional display and selection options.

Oblique Imagery: Measure Coordinates



The Measure Coordinates tool returns the location of a point of interest. After clicking on a location, its coordinates (latitude-longitude in decimal degrees) will appear in the grey box in the lower right-hand corner of the oblique image viewing window.

Oblique Imagery: Measure Distance



The Measure Distance tool returns the straight-line distance between two points on the ground, the length of a user-defined jagged or smooth ("free-form") line at ground level, or the total distance around an area of interest (perimeter) at ground level. The distance or length in feet is displayed in the grey box in the lower right-hand corner of the oblique image viewing window.

Straight-line Length or Distance



Click on the first point, hold down your left mouse button, drag to the second and final point, and release your mouse button.

Smooth, Free Form Length or Distance



Click on the first point, hold down your left mouse button, press and release your Alt key, drag to the final point, and release your mouse button.

Perimeter / Jagged Length or Distance



Click on the first point, hold down your left mouse button and drag, pressing your “v” key to add vertices where changes in direction are desired. Release your mouse button when finished.

Parallelogram Perimeter



Click on the first point to begin your perimeter, hold down your left mouse button and drag to your second point, hold down your control key, and drag your mouse across the desired length of your perimeter. Release your mouse button when finished.

Oblique Imagery: Measure Height



The Measure Height tool returns the vertical distance from ground level to the top (or any point along a vertical line above ground level) of any object that rises above the ground. An object's height in feet is displayed in the grey box in the lower right-hand corner of the oblique image viewing window. Starting from the ground, click on the first point near the bottom of an object, hold down your left mouse button, move to the second point near the top of the object, and release your mouse button.

Oblique Imagery: Measure Elevation



The Measure Elevation tool returns the elevation above sea level of a ground point, as well as the change (or difference) in elevation between two ground points.

- Elevation at a single point: click on a point of interest at ground level. The results in feet are displayed in the grey box in the lower right-hand corner of the oblique image viewing window.
- Change in elevation between two points: click on the first point, hold down your control key while holding down your left mouse button, move to the second point, and release your mouse button.

Oblique Imagery: Measure Area



The Measure Area tool returns the area within a user-defined polygon at ground level or parallel to the ground. Polygons may be drawn using three techniques: jagged, smooth ("free-form"), or parallelogram. The area in square feet is displayed in the grey box in the lower right-hand corner of the oblique image viewing window.

- Smooth, free-form area: click on the first point, hold down your left mouse button, press and release your Alt key, then drag to the final point. Release your mouse button when finished. The final point will automatically snap to the first point, closing the polygon.
- Jagged area: click on the first point, hold down your left mouse button and drag, pressing your "v" key to add vertices where changes in direction are desired. Release your mouse button when finished. The final point will automatically snap to the first point, closing the polygon.
- Parallelogram: Click on the first point to begin your polygon, hold down your left mouse button and drag to your second point, hold down your control key, and drag your mouse across the desired length of your polygon. Release your mouse button when finished.

Oblique Imagery: Measure Bearing



The Measure Bearing tool returns bearing, or the direction from a line drawn between a point on the ground (vertex) and North (or an object of interest) and another line drawn between the vertex and another object of interest, forming a triangle. Bearing (in degrees) is displayed in the grey box in the lower right-hand corner of the oblique image viewing window.

- Measuring bearing between North and an object of interest: click to establish the vertex of your triangle, hold down your left mouse key and
- Measuring bearing between two objects of interest: click to establish the vertex of your triangle, hold down your left mouse key and drag to the first point of interest, hold down your control key, drag to the second point of interest, and release your mouse button.

Oblique Imagery: Rotate Clockwise



By default, oblique images are displayed with a view from the south looking north. The Rotate Clockwise tool allows the user to reorient their view, making it possible to view four sides of an object visible in an oblique image. Click the button on the toolbar once to view your location from the east looking west, twice to view from the north looking south, a third time to view from the west looking east, and a fourth and final time to return to the default south-looking-north view. The view's orientation is displayed in the grey box in the lower right-hand corner of the oblique image viewing window.

Oblique Imagery:

Switch to Oblique (Angled) View

Switch to Orthogonal (top down) View



The Oblique imagery viewer allows the user to toggle between an oblique ("bird's eye") view and an orthogonal (straight down) view of a location. The orthogonal view will be similar to the view seen in the main Map Window when one of the aerial photo layers is visible.

Oblique Imagery:

Zoom In ("Neighborhood" View)

Zoom Out ("Community" View)



The Zoom In & Zoom Out tools allow the viewer to toggle between two fixed viewing scales. Each scale displays a different image of the same location, captured at one of two levels of resolution and extent. "Neighborhood View" offers a higher resolution, more detailed image that

is displayed over a smaller viewing extent. “Community View” does the opposite: a lower resolution, less detailed image is displayed over a larger viewing extent.

Oblique Imagery: Center the Map View on the Oblique View

Clicking this tool will adjust the view in the main Map Window to approximately match the location displayed in the oblique viewing window.

Clicking this tool will adjust the view in the oblique viewing window to approximately match the location displayed in the main Map Window.

4) Exercises

Exercise 4a. Generate a List of Owner Names & Addresses for a Group of Parcels

The public works department of the village for which you work is planning a sewer repair project; it is expected that nearby property owners will experience disruptions while the project is underway. You have been asked to notify those property owners whose parcels abut the street segment where the project is planned. In this exercise, you will take advantage of the Interactive Mapping Service's navigation (sections 2b and 3b), selection (section 3b), and data export (section 3g) capabilities to generate a table of information related to the properties affected by the sewer repair project.

- First, use the Jump to Extent tool (located in the lower left hand corner of the Map Window) to zoom to West Milwaukee, where our hypothetical public works project is being planned along S. 54th St. between W. Mitchell St. to the north and W Burnham St. to the south). Select "Village of West Milwaukee" from the drop-down list, and then click the black arrow button.
- Now use the Overview Map and the navigation toolbar's zoom and pan tools (or, if you prefer, the Navigation Controls located in the upper left hand corner of the Map Window) to locate and center the Map Window on the segment of S. 54th St. that we are interested in.
- Next, ensure that the Tax Parcels layer in the Layer List is visible and active (refer to section 2c for more information). Access the Selection toolbar and practice using all six selection tools (point, polyline, polygon, rectangle, oval, or circle) to create a selection set of all parcels that fall along S. 54th St.
- When using one of the selection tools after a group of parcels has already been selected, a window appears near the bottom of the Information Panel to the left of the Map Window. Take a moment to familiarize yourself with the options presented there for replacing, combining, intersecting, or removing features in selection sets. For more information on selection results options and selection sets, see section 3b.
- Regardless of the selection method you used, you should have 30 parcels in your selection set. The Selection Results Window that appears (near the bottom of the Information Panel to the left of the Map Window) will show the number of parcels in your selection set, additional tools for working with your selection set, and options for viewing and exporting data associated with the selected parcels.
- Click "Export Parcel Info to XLS" in the Selection Results window, then "Download" in the box that appears next (to avoid popup blocker issues, hold down the control key when clicking "Download"). The resulting Excel spreadsheet presents a "Parcel Information Report" worksheet with owner name and address, as well as other details, for each of the 30 selected parcels.
- If all you need is the name and address of the owner or occupant, the Mailing Label feature is an alternative to downloading an Excel spreadsheet. Select either of the two Mailing Label options (owner & occupant) from the Selection Results window to download pre-formatted mailing labels in PDF format.

Exercise 4b. Add Markups to an Area of Interest

In Exercise 4a we located an area where a hypothetical project is being planned, selected all parcels that will be affected by that project, and exported information about those parcels. You may find it useful to add to the map some of your own information about the project. In this exercise, we will use the Markup Tools to draw a boundary around the project area and to add some notes about the project. For more about markups, see section 3c.

- First, return to the project area described in Exercise 4a if necessary. Next, access the Markup toolbar and select the polygon markup tool. Notice how the markup tools look and function much like the tools provided in the Selection toolbar.
- When you select a markup tool, a window appears near the bottom of the Information Panel to the left of the Map Window. If you want your markup shape's appearance to differ from the default style, change the style in this window before drawing the markup shape on the map. Take a moment to familiarize yourself with the many boundary color and fill style options available in this window.
- Draw a boundary around the project area that encompasses the 30 parcels that you identified in Exercise 4a. To begin the markup shape, click on the map where you wish to begin, click to add additional vertices or corners to your shape, and double click to finish the shape. If you wish, practice using the other markup shapes that are available. If you want to start over, the Clear tool in the Markup toolbar allows you to remove all markups added to the map, while the Erase tool allows you to selectively remove markups.
- Next, practice using the Text markup tool to add a note or two about the hypothetical sewer repair project. The first click determines where the text will be placed. You might want to add the project's start date, name, manager, etc. (it's entirely up to you). Notice the text appearance options that become available when the Text tool is selected.
- You will now save your map as a project so you can return to it for Exercise 4c. Access the Project toolbar, select Save, and give your map a unique name (or Project ID) by clicking Rename, or accept the default name. Click Continue to save your map project. Notice that a unique Project URL (or link) was created using the name you gave your project:

PROJECT ID: **Your_Project**

Project URL: http://maps.milwaukeecounty.org/Geocortex/Essentials/Web/Viewer.aspx?Project=Your_Project

Keep in mind that you will need to remember the name you gave to your map project to return to it later; click "Copy Project ID" or "Copy Project URL" and paste these into Notepad or Word to aid you in remembering your map project's name.

Exercise 4c. Return to and Share a Map Project

In Exercise 4b, you added your own markups to create a customized sewer repair project map. To retain the properties of your map (the markups you added, the map's extent or area of interest, etc.) for later use by you or someone else, the Interactive Mapping Service allowed you to save your map as a project. In this exercise, you will return to your map project and cover ways in which another person can view your map project on their own web browser.

- First, exit and reopen the Interactive Mapping Service. Access the Project toolbar that you used to save your map project in Exercise 4b. Click the Open tool and enter the name you gave your map in Exercise 4b. Or, if you saved your project's URL, paste it into your browser's address bar and reenter your login information.
- If you wish to share your map project, simply forward your project's name (Project ID) or the project's URL to anybody with access to the Interactive Mapping Service's secure viewer. Another person can access your map project using its Project ID via the Project toolbar's Open tool or by hyperlinking to your project's URL.

Exercise 4d. Print a Customized Map

In exercise 4c, you returned to a map project that you saved earlier using the Interactive Mapping Service's Project tools. In this exercise, you will learn how to print your map project.

- First, access the Print toolbar and click the Print tool. Select one of the three map layouts choices (Templates) that are available: letter-size portrait, letter-size landscape, or tabloid-size landscape.
- Next, you are presented with output format, resolution, and scale options. Output format may be PDF, rich-text format (RTF), or TIFF image. After making a selection for each of these, add a title and notes (if you desire), and click Export. Another window will appear. While holding down the CTRL key to bypass your popup blocker, click Download, then Open to immediately view the exported map, or select Save if you want to save the exported file to a directory.